



ENVIRONMENT, HEALTH

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY



SAFETY DIVISION

Pub-3000 Chapter 8 “Electrical Safety” Overview of Revisions

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What's Revised/Reformatted:

- Document is easier to understand and implement
- Uses graphs and flow charts in addition to informational tables (section 8.7)
- Includes separate criteria for distribution power, high voltage stored energy systems, and batteries (section 8.7)
- Uses separate hazard control tables for R&D and premises wiring (section 8.7)
- Hazard control requirements are clearly outlined (section 8.7)
- Supportive information is now in appendices
- Criteria for becoming an electrically Qualified Person is defined, including background training profiles (section 8.8)
- Links to other information are provided
- Defines permit processes and allows for standing procedures for repetitive processes of diagnostics and testing. (section 8.7)
 - Replaces the need for Appendix A1 permits in most applications
 - Must have line management approval
- Electrical technical terms are identified (lower case capital font) and are defined in definitions section of chapter (appendix D)

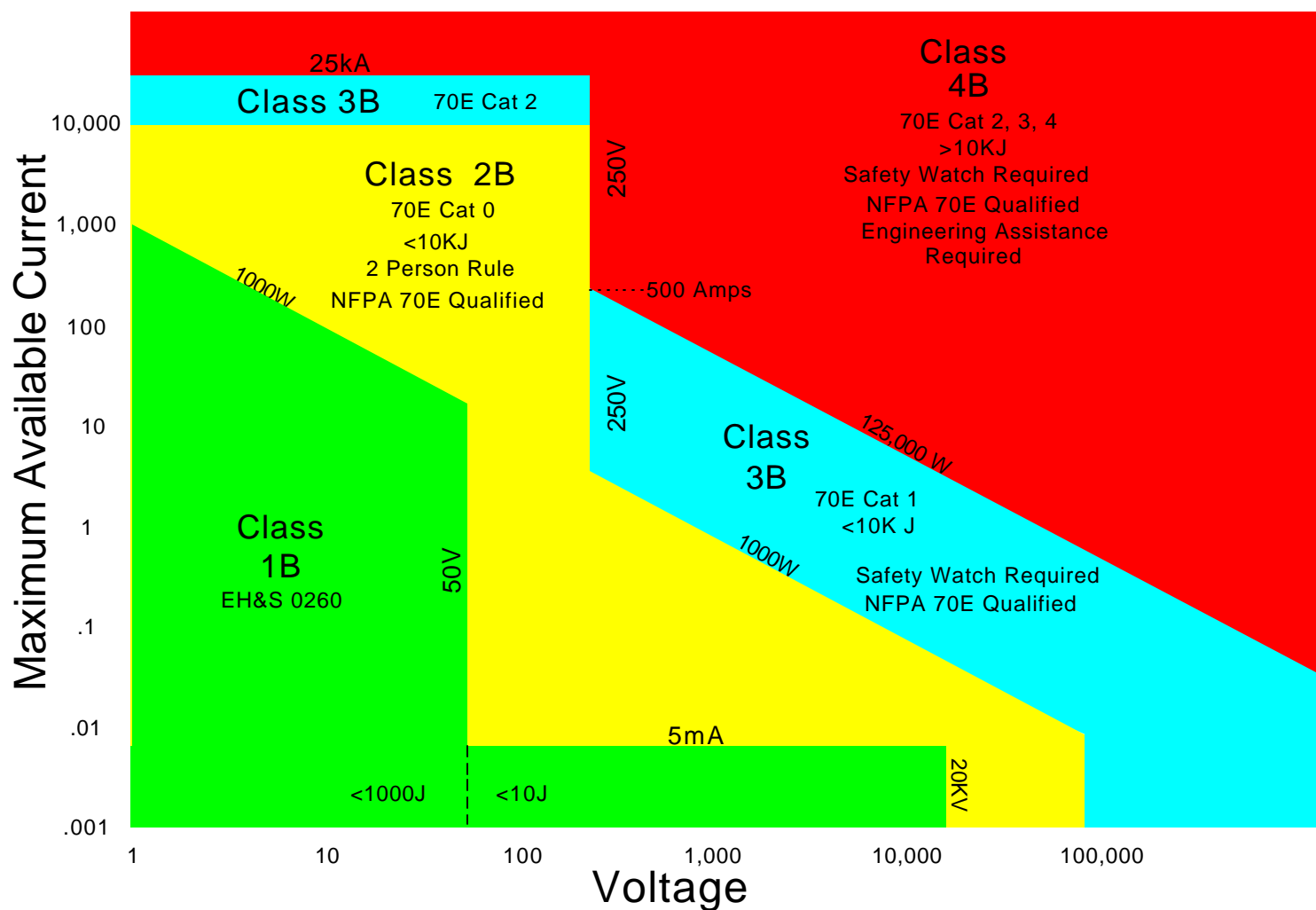


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R&D EQUIPMENT/STORED ENERGY



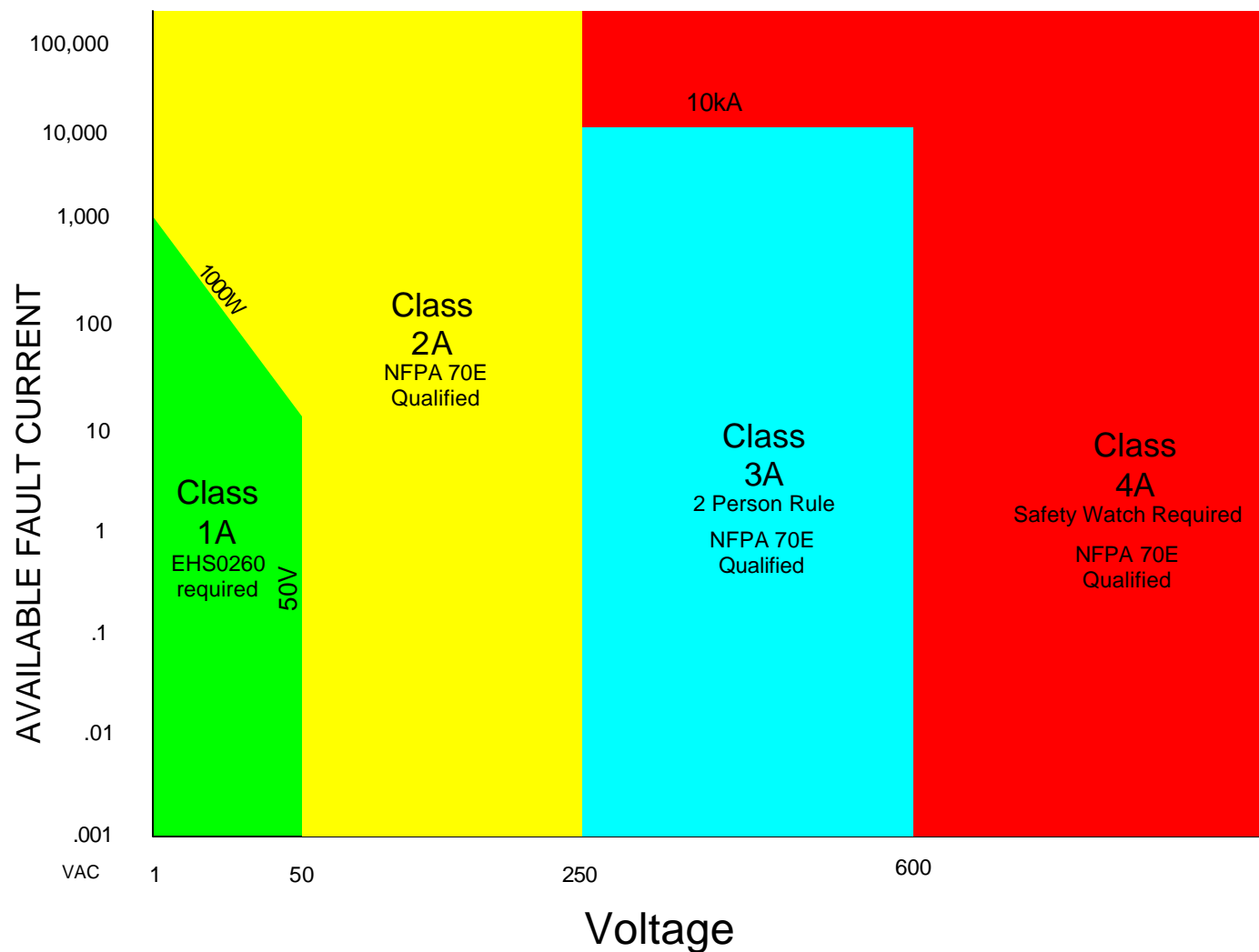


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Facilities Energized Hazard Classes



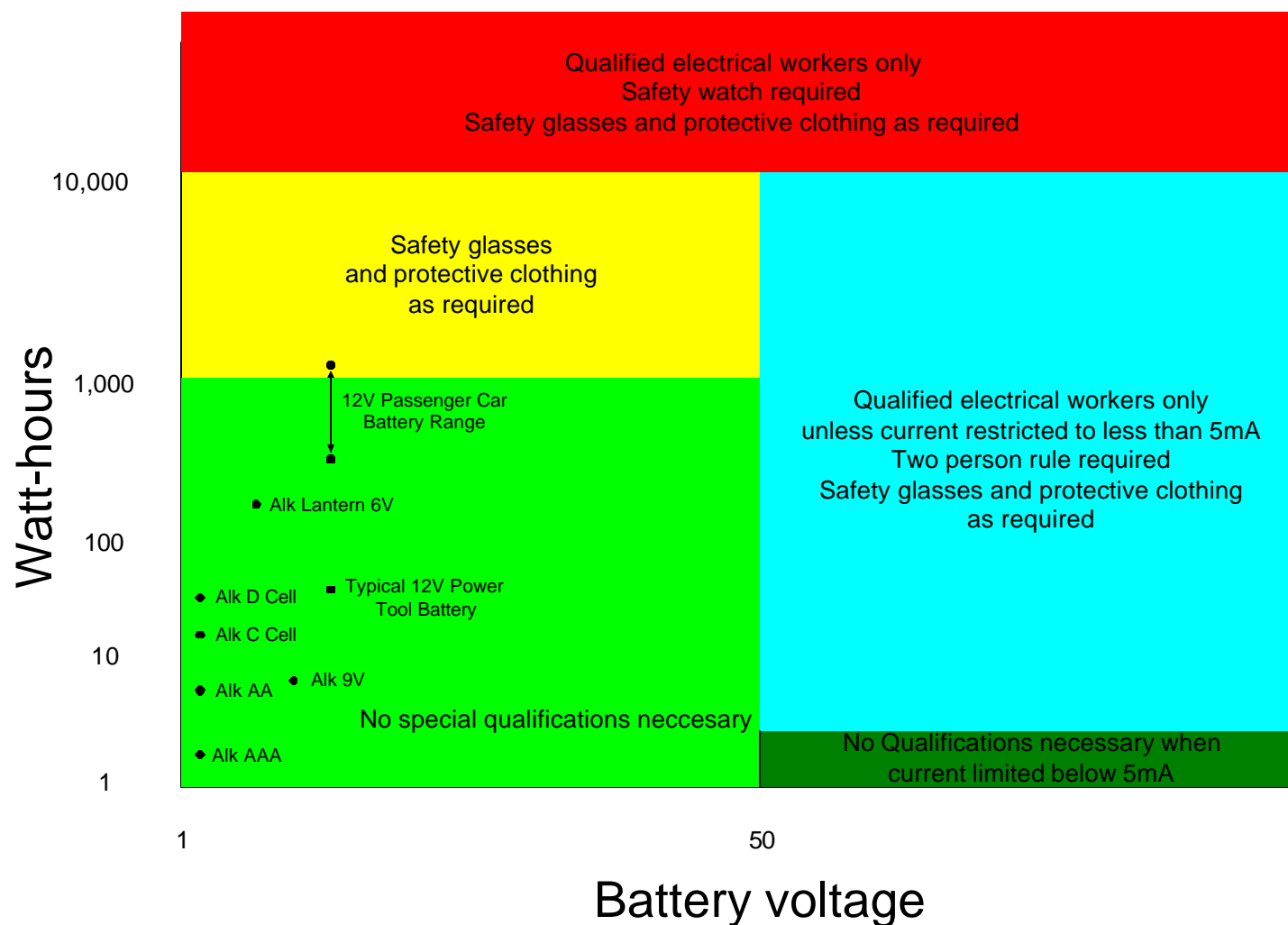


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Battery Hazard Control Requirements





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R&D Energized Electrical Work Requirements

Hazard Class	Qualification Requirements	Authorization Requirements	Hazard Control Requirements		Energized Electrical Work Documentation
R&D Class 1B	<p>EHS 260 Basic Electric Hazard Awareness.</p> <p>Trained and knowledgeable about the equipment and site.</p> <p>Familiar with safe work practices, PPE, tools and test equipment.</p>	Approval by Supervisor	De-energized	A qualified person may work alone.	None
			Diagnostic & Test		
			Energized Manipulative	• If exposed voltages are less than 50V differential, or to ground, a qualified person can work alone with implied approval and general supervision.	
R&D Class 2B	<p>EHS 256 Lockout/Tagout</p> <p>EHS 249 Electrical Safety for Electronic Technicians.</p> <p>EHS 116 & EHS 123 First Aid & CPR.</p> <p>EHS 267 NFPA 70E.</p> <p>Trained and knowledgeable about the equipment and site.</p>	<p>Authorization by Supervisor.</p> <p>Authorization by Division Management.</p>	De-energized	• A qualified person may work alone.	• None
			Energized Diagnostic & Test	<p>The two-person rule is mandatory</p> <p>Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E.</p> <p>Access restricted by barricades per NFPA 70E</p>	<p>Appendix C: Job Planning Checklist</p> <p>Appendix A1: Energized D&T Job Briefing Form</p>
			Energized Manipulative	<p>A Safety Watch is required.</p> <p>Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E.</p> <p>Access restricted by barricades per NFPA 70E</p>	<p>Appendix C: Job Planning Checklist</p> <p>Appendix B: Energized Manipulative Electrical Work Permit</p>
R&D Class 3B & 4B		<p>Authorization by Supervisor.</p> <p>Authorization by Division Management.</p>	De-energized	• A qualified person may work alone.	• None
			Energized Diagnostic & Test	<p>A Safety Watch is required.</p> <p>Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E .</p>	<p>Appendix C: Job Planning Checklist</p> <p>Appendix A1: Energized D&T Job Briefing Form</p>
			Energized Manipulative	Access restricted by barricades per NFPA 70E	<p>Appendix C: Job Planning Checklist</p> <p>Appendix B: Energized Manipulative Electrical Work Permit</p>



Facilities Energized Electrical Work Requirements

Hazard Class	Qualification Requirements	Authorization Requirements	Hazard Control Requirements		Energized Electrical Work Documentation
Facilities Class 1A	EHS 260 Basic Electric Hazard Awareness. Trained and knowledgeable about the equipment and site. Familiar with safe work practices, PPE, tools and test equipment.	Approval by Supervisor	De-energized	A qualified person may work alone.	None
			Diagnostic & Test		
			Manipulative	• A qualified person may work alone.	
Facilities Class 2A	EHS 256 Lockout/Tagout. EHS 250 Electrical Safety for Electricians. EHS 116 & EHS 123 First Aid & CPR. EHS 267 NFPA 70E. Trained and knowledgeable about the equipment and site.	Authorization by Supervisor. Authorization by Division Management.	De-energized	• A qualified person may work alone.	• None
			Diagnostic & Test	Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E . Access restricted by barricades per NFPA 70E.	Appendix C: Job Planning Checklist Appendix A1: Energized D&T Job Briefing Form
			Manipulative	A Safety Watch is required. Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E . Access restricted by barricades per NFPA 70E	Appendix C: Job Planning Checklist Appendix B: Energized Manipulative Electrical Work Permit
Facilities Class 3A		Authorization by supervisor. Authorization by Division Management.	De-energized	• A qualified person may work alone.	• None
			Diagnostic & Test	The two-person rule is mandatory. Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E . Access restricted by barricades per NFPA 70E	Appendix C: Job Planning Checklist Appendix A1: Energized D&T Job Briefing Form
			Manipulative	A Safety Watch is required. Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E . Access restricted by barricades per NFPA 70E	Appendix C: Job Planning Checklist Appendix B: Energized Manipulative Electrical Work Permit



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SAFETY DIVISION

Facilities Energized Electrical Work Requirements (Con't)

Facilities Class 4A	<p>EHS 256 Lockout/Tagout.</p> <p>EHS 250 Electrical Safety for Electricians.</p> <p>EHS 116 & EHS 123 First Aid & CPR.</p> <p>EHS 267 NFPA 70E.</p> <p>FAC 030 High Voltage Safety Training.</p> <p>Trained and knowledgeable about the equipment and site.</p>	<p>Authorization by Supervisor.</p> <p>Authorization by Division Management.</p>	De-energized	<ul style="list-style-type: none"> A qualified person may work alone. 	<ul style="list-style-type: none"> None
			Diagnostic & Test	<p>A Safety Watch is required.</p> <p>Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E .</p> <p>Access restricted by barricades per NFPA 70E</p>	<p>Appendix C: Job Planning Checklist</p> <p>Appendix A1: Energized D&T Job Briefing Form</p>
			Manipulative	<p>A Safety Watch is required.</p> <p>LBNL personnel must not work on Class 4A equipment in Mode 3, except for certain testing procedures performed under a Facilities Department Switching Tag.</p> <p>Insulated gloves, insulated tools and other personal protective equipment (PPE) per NFPA 70E .</p> <p>Only commercial power utility personnel or their subcontractors will work on energized Class 4 equipment, and they will follow their own procedures.</p> <p>Access restricted by barricades per NFPA 70E</p>	<p>Facilities Department Switching Tag.</p> <p>Only commercial power utility personnel or their subcontractors will work on energized Class 4 equipment, and they will follow their own procedures.</p> <p>Appendix C: Job Planning Checklist</p> <p>Appendix B: Energized Manipulative Electrical Work Permit</p>

